**Breaking Down the Steps of Cellular Respiration - KEY**

Ms. Ottolini, AP Biology

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| **Process** | **Overall Description**  (including reactants, products, and enzymes or structures used) | **Location in Cell or Mitochondrion** | **Amount of ATP Produced and Type of ATP Production** | **Electron Carriers Produced or Used** | **What is Oxidized?** | **What is Reduced?** |
| **Glycolysis** | In this step, glucose is broken down into two pyruvate molecules. | This step takes place in the cytoplasm/cytosol of the cell. | 2 ATP are created through substrate-level phosphorylation | 2 NADH are produced | Glucose is oxidized | NAD+ is reduced |
| **Creation of Acetyl CoA** | In this step, pyruvate is broken down into acetyl CoA and CO2. | This step takes place in the matrix of the mitochondrion. | No ATP are created | 2 NADH are produced | Pyruvate is oxidized | NAD+ is reduced |
| **Kreb’s Cycle / Citric Acid Cycle** | In this step, acetyl CoA is broken down to CO2, but the overall goal is to make electron carriers like NADH and FADH2. | This step takes place in the matrix of the mitochondrion. | 2 ATP are created through substrate-level phosphorylation | 6 NADH and 2 FADH2 are produced | Acetyl CoA is oxidized | NAD+ and FADH are reduced |
| **Electron Transport Chain / Chemiosmosis** | In this step, we use energy from electrons in NADH and FADH2 to create an H+ gradient. The H+ gradient allows us to use ATP synthase to create a lot of ATP. | This step takes place across the mitochondrial inner membrane | 32-34 ATP are created through oxidative phosphorylation | All NADH and FADH2 made in the last three steps are used | NADH and FADH2 are oxidized | Oxygen gas (O2) is reduced |